



Physical Anthropology Section – 2004

H97 A Quantitative Study of Morphological Variation in the OS Coxa for the Purpose of Estimating Sex of Human Skeletal Remains

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After attending this presentation, attendees will understand skeletal variability and forensic anthropological application.

This presentation will impact the forensic community by demonstrating the contribution of further data to the understanding of skeletal variation.

The study of sexual dimorphism in the morphology of the *os coxa* has long been core of osteological analysis and essential to forensic anthropological investigation. Past research clearly documents the *os coxa* to be one of the most suited elements for the estimation of sex in human skeletal remains. Although not exclusively, previous studies have focused primarily on qualitative assessments of pelvic shape and few have proposed specific quantitative dimensions to substantiate observed qualitative patterns of variation. This study addresses past observations of size and shape variation in male and female pelvic morphology by documenting sexual dimorphism in the *os coxa* by the application of alternative measurements. The study also examines the possibility of further characterizing and testing shape variation in the *os coxa*.

Twenty-two measurements were recorded on a calibration sample of 80 females and 80 males from the Robert J. Terry Osteological Collection housed at the Smithsonian Institution, Washington, D.C. The data represent members of varied group affiliations and ranging in age from 25 and 50 years. In addition to standard length and breadth dimensions, alternative measurements specifically developed to quantify qualitative observations include, among others, the sub pubic angle, size of the rami, shape of the obturator foramen, and dimensions of the auricular surface. Other measurements characterizing the pelvic basin shape and size are also recorded. All measurements were taken with standard equipment including spreading, coordinate and sliding calipers and an osteometric board.

Summary statistics were generated for the purpose of univariate assessments and a stepwise discriminant procedure with a MAXR option was applied to the data to generate a multivariate assessment of the sex discriminating ability of the proposed recording protocol.

The results derived from the calibration sample were applied to two independent test samples, including a separate sample of 20 males and 20 females from the Terry collection and 18 males and 15 females from the WSU-BAL Cadaver Collection housed at Wichita State University Biological Anthropology Laboratory.

The results of our study provides promising insight to quantifying sexual dimorphism in the *os coxa* and concludes that measurements can be applied to better characterize overall shape differences between the sexes which have previously been mostly limited qualitative assessments. We further conclude that traditional observations of sexual dimorphism in the *os coxa*, especially those commonly used in nonmetric assessments, are not be as distinct as sometimes expressed. Finally, the results presented here provide an added contribution to the estimation of sex in skeletal remains in both forensic and archaeological settings.

Os Coxa, Sex Estimation, Skeletal Variation